Pinguicula chilensis—habitat observations from the Nahuelbuta National Park in Chile

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The butterwort species *Pinguicula chilensis* Clos is one of two species known to grow in Chile (the other being *P. antarctica*). According to Casper (1966), *P. chilensis* occurs along the Central Andean Mountain Range, ranging from 35° southern latitude (Laguna del Maule) to 38° southern latitude (Parque Nacional Nahuel Huapi). It is also found in the Valdivian Coastal Cordillera. The Andean habitat of *P. chilensis* is wet meadows (locally called mallín) at the edge of melting snow fields on volcanoes and other high mountains. The plants grow in altitudes of 1700 to 3000 m. Little is known about the habitat in the Valdivian Coastal Mountains.

In addition to this range, Rodriguez *et al.* (2000) mention that *P. chilensis* also grows in the Parque Nacional Nahuelbuta, located about 300 km north of the habitats in the Valdivian Coastal Cordillera. I had the opportunity to visit the National Park four times between 2004 and 2006.

The National Park is located in the Cordillera de Nahuelbuta (east of the city of Angol in the Province of Malleco at 37° southern latitude) and comprises an area of 6832 hectares. This National Park is the last refugium of an *Araucaria araucana* (monkey puzzle tree) coastal forest. The two highest peaks are Alto Nahuelbuta (1530 m a.s.l.) and Cerro Nahuel (1472 m a.s.l.). The annual precipitation is 1200-1500 mm. While in the dry summer the highest daily temperatures can be around 20°C (68°F), in winter (July to September) frosts occur and snow accumulation can be up to 1 meter (3 feet) deep in the highest regions of the mountains. Typical trees of the forest are *Araucaria araucana* (the oldest tree found in the park has an age of about 1500 years!), *Nothofagus antarctica* (Spanish: ñirre), *Nothofagus pumilio* (Spanish: lenga) and *Nothofagus dombeyi* (Spanish: coigüe). Very attractive when in flower is also the parasitic plant *Desmaria mutabilis*, which lives on *Nothofagus* species and is pollinated by a hummingbird. As there are often clouds coming up into the mountains from the sea, the high humidity favours the growth of epiphytic *Usnea barbata* mosses. In winter the *Nothofagus* species have no leaves, which gives the landscape a quite mystic image.

Pinguicula chilensis at Nahuelbuta National Park occurs in two different habitats. Small populations can be found in the forest at springs along the El Aguilucho trail at an altitude of about 1260 m. These plants mainly grow with mosses in shade under trees and shrubs. The soil is wet year-round, is consists exclusively of organic material. However, the main habitat in the National Park is the Las Turberas area. This is a plateau at an altitude of 1250 m where several small creeks form a kind of a bog, with small islands with grasses and shrubs. There is no *Sphagnum*, but the soil is high in organic matter. *Pinguicula chilensis* grows mainly in shaded places under grasses. During the summer months (December-February) the rosettes can reach a size of up to 5-8 cm (2-3 inches). Some plants grow in direct sun. The leaves of these plants are red-yellowish and the rosettes are smaller. In January the soil where most of the plants occurred was damp, only at few places were plants growing in very wet conditions. At this location, *Drosera uniflora* also occurs.

Like all other temperate *Pinguicula* species of South America, the plants do not form hibernacula but instead overwinter with a rosette. In September leaf rosettes are only up to 3.5 cm (1.4 inches) in diameter and the rosette is more compact with upturned leaf margins. During the winter, plants growing in vertical habitats near the flowing water are probably not protected by a blanket of snow, therefore they should be able to survive temperatures below freezing. However, it is not known what are the lowest temperatures are the plants could survive.

Figure 1: *Pinguicula chilensis* habitat at Las Turberas.

Figure 2: Front and side view of flower at Las Turberas.

Flowering begins at the end of December and ends in February. Ernst (1961) mentioned that one of the distinctive characters of this species is the almost glabrous flower stalks (i.e. they do not have glands or hairs). In the Las Turberas area most of the flower stalks did not bear glands, but at the El Aguilucho trail site I saw plants with quite a number of glands on the pedicels. Therefore an almost glabrous flower stalk is not a unique character of the species. The maximum number of flowers per plant found was three, while most of the plants formed one or two flowers. The flower stalks of *P. chilensis* at both locations did not exceed 2 cm (0.8 inches), and were often shorter. The sizes of all the corolla lobes are very similar (beside the slightly longer middle lobe of the lower lip). The lobes are obovate and most are shallowly notched up to I mm. The palate on the middle lobe of the lower lip consists of two separate parts and bears long yellow hairs. The position of the palate is a main distinguishing feature to *P. antarctica*. While the palate in *P. chilensis* can be found in the tube close to the apex of the middle lobe of the lower lip, in *P. antarctica* the palate is located at the base of the middle lobe of the lower lip, closer to the spur (Ernst 1961) The 2-3 mm long, tubular spur is pale green. The conical tube is much longer than the tubes of other South American *Pinguicula* (Casper 1966). The corolla is white or pale-violet, showing a violet venation on the proximal part of the lobes (i.e. near the corolla tube). The tube is veined dark violet. The flower venation was very pale at the smaller El Aguilucho trail population; at Las Turberas most of flowers have very dark venation, very similar to *P. antarctica*. The weaker venation could be due to shade.

Very few tiny insects could be found on the leaves during December and January, while in October almost no insects were present on the leaves. How the flowers are pollinated is not known, but I believe they probably mostly self-pollinate because the flowers are small and hidden under grasses. Plants in cultivation produce seed without pollination.

The habitat of *P. chilensis* in the Nahuelbuta National Park is currently not in danger. The park is well managed and the main habitats are not shown on maps. Furthermore climatic changes are not likely to have an immediate impact on the habitat even if the annual rainfall were to decrease slightly.

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Looking Back: CPN 25 years ago

Editor Don Schnell wrote: "Carnivorous Plant Newsletter is now entering its eleventh year, and those who have been with us all the way or at least of for a greater part of those ten previous years have watched this publication grow from a small offset looseleaf format to our present fine journal with wide-ranging articles and features serving many interests worldwide. CPN is widely respected, is now being carried by more libraries, and even crops up now and then in formal journal or book bibliographies." Don continued to give compliments to the ICPS seed bank, then run by Patrick Dwyer (who else remembers Patrick?). Reading Don's comments inspired me (BR) to write this issue's editorial on Jan's and my last ten years with CPN. Who will be writing "Looking Back" 25 years from now?